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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,824	04/12/2001	Richard B. Ertel	907.0001USU (SL-054)	5042
29683	7590	11/03/2004	EXAMINER	
HARRINGTON & SMITH, LLP 4 RESEARCH DRIVE SHELTON, CT 06484-6212			WANG, TED M	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/833,824

Applicant(s)

ERTEL ET AL.

Examiner

Ted M Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

1. Claims 3, 4, 6, 9, 10, and 12 are objected to because of the following informalities:

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- With regard claims 3, 4, and 6, line 1, "A method" should be changed to "The method" respectively.
- With regard claims 9, 10, and 12, line 1, "A system" should be changed to "The system" respectively.
- With regard claim 3, line 3, the numeral number "P" has not be defined.

Appropriate correction is required.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-5 and 7-11 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 3-7 and 11-15, respectively, of copending Application No. 09/834,667. Although the conflicting claims are not identical, they are not patentably distinct from each other because the broader application claim would have been obvious in view of the narrower issued claim.

- For example, Claim 3 of copending Application No. 09/834,667 recites the limitations: a method comprising “within a coverage area of a base station (BS), assigning the same spreading code to a plurality of subscriber stations (SSs)”, “and conducting communications between said BS and said plurality of SSs”, “wherein the step of conducting communications includes steps of despread a plurality of received signals; and beamforming the plurality of despread received signals”. On the other hand, claim 1 of the instant application recites the limitations: a method comprising “ within a coverage area of a base station (BS), assigning the same spreading code to a plurality of subscriber stations (SSs)”, “despread a plurality of received signals”, “and beamforming the plurality of despread received signals.” Therefore, claim 1 of the instant application merely broadens the scope of copending Application No. 09/834,667 by eliminating the limitation “and conducting communications between said BS and said plurality of SSs”. It is obvious the limitations of claim 3 of copending Application No. 09/834,667 read on the limitations of claim 1 of the instant application. Further, it has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same functions as before. See *In re Karlson*, 136 USPQ 184 (CCPA 1963). Also note *Ex parte Rainu*, 168 USPQ 375 (BdPatApp&Int 1970); omission of a reference element whose function is not needed would be obvious to one skilled in the art.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 6,122,260) in view of Umeda et al. (US 5,568,472).

- With regard claim 1, Liu et al. discloses a smart antenna CDMA wireless communication system comprising:

despreading a plurality of received signals (Fig.9 elements 98 and 100 and column 10 lines 35-52); and

beamforming the plurality of despread received signals (Fig.9 elements 104 and 106 and column 10 lines 35-52).

Liu et al. discloses all of the subject matter as described above except for specifically teaching within a coverage area of a base station, assigning the same spreading code to a plurality of subscriber stations.

However, Umeda et al. teaches within a coverage area of a base station, assigning the same spreading code to a plurality of subscriber stations (column 2 line 11 – column 3 line 6).

It is desirable to have a coverage area of a base station, assigning the same spreading code to a plurality of subscriber stations in order to effectively increase

the number of communication channels through use of a limited number of spreading codes (column 2 lines 2-6). Without this implementation in a communication system, the number of communication channels is limited.

Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the method as taught by Umeda et al. as described above, in which within a coverage area of a base station, assigning the same spreading code to a plurality of subscriber stations, into Liu's CDMA wireless communication method so as to increase the number of communication channels through use of a limited number of spreading codes.

- With regard claim 7, which is a system claim related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.

6. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 6,122,260) and Umeda et al. (US 5,568,472) as applied to claim 1 above, and further in view of Upadhyay et al. (US 6,115,409).

- With regard claim 2, Liu et al. further teaches spatial filtering or beamforming the plurality of despread received signals performed at the symbol rate of the received signal (Fig.9 elements 104 and 106 and column 10 lines 35-52). Note that it is well known in the art that in an adaptive array antenna (or smart antennas) antenna element outputs are multiplied by controlling weights to steer and shape the antenna array pattern to either direct nulls towards the jammers, direct a beam towards the desired signal, or form an antenna pattern that

accomplishes both by optimizing the signal-to-interference-plus-noise (SINR) power ratio, which is referred to (more generally to) as spatial filters.

Liu et al. and Umeda et al. discloses all of the subject matter as described above except for specifically teaching the spatial filtering using complex multiply operation.

However, Upadhyay et al. teaches a spatial filtering using complex multiply operation (Fig.5 elements 31-33 and W_a and column 9 line 54 – column 10 line 11).

It is desirable to have a spatial filtering using complex multiply in order to improve the precision of the output of the spatial filter and reduce the narrow-band interference with digital implementation (abstract, column 9 lines 4-28, and column 10 lines 5-11). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the method as taught by Upadhyay et al. as described above, in which have a spatial filtering using complex multiply, into Liu and Umedas' spatial filter or beamforming or smart antenna so as to the narrow-band interference.

- With regard claim 8, which is a system claim related to claim 2, all limitation is contained in claim 2. The explanation of all the limitation is already addressed in the above paragraph.

7. Claim 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 6,122,260) and Umeda et al. (US 5,568,472) and Upadhyay et al. (US 6,115,409) as applied to claim 2 above, and further in view of Huang (US 6,370,129).

- With regard claim 3, Liu et al. and Umeda et al. and Upadhyay et al. discloses all of the subject matter as described above except for specifically teaching wherein an antenna array has M-elements ($M > 1$), wherein individual ones of P orthogonal spreading codes are reused αM times within the coverage area, where $1/M < \alpha \leq 1$. However, Huang teaches that an antenna array has M-elements ($M > 1$) (Fig. 1 elements 100 and 110-i, and column 4 lines 38-60), wherein individual ones of P orthogonal spreading codes are reused αM times within the coverage area), where $1/M < \alpha \leq 1$ (Fig. 3, 5, 14, 16, 18, 20, 22A, and 22B, column 5 lines 12-32, column 8 lines 13-67).

It is desirable to have an antenna array with M-elements ($M > 1$), wherein individual ones of P orthogonal spreading codes are reused αM times within the coverage area so that the reception in fading environments and the system level capacity and spectral capacity can be improved. Without this improvement, the system capacity is limited with higher signal to noise ratio (SNR). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the method as taught by Huang as described above, in which the method with an antenna array with M-elements ($M > 1$), wherein individual ones of P orthogonal spreading codes are reused αM times within the coverage area, into Liu and Umeda and Upadhyays' receiving operating method so as to improve the reception in fading environments and system level capacity and spectral capacity.

- In regard claim 9, which is a system claim related to claim 3, all limitation is contained in claim 3. The explanation of all the limitation is already addressed in the above paragraph.

8. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 6,122,260) and Umeda et al. (US 5,568,472) as applied to claim 1 above, and further in view of Liu (US 5,864,548).

- With regard claim 5, Liu et al. further discloses spatially filtering or beamforming a signal to be transmitted (elements 154 and 156); combining the outputs of a plurality of spatial filters to provide a combined signal to be transmitted (Fig.8 element 158).

Liu et al. and Umeda et al. discloses all of the subject matter as described above except for specifically teaching spreading the combined signal prior to transmitting the combined signal.

However, Liu teaches a system for fast modulation in synchronous CDMA communications spreading the combined signal prior to transmitting the combined signal (Fig.3 elements 13, 28, and 42A and column 7 line 59 – column 8 line 54) in order to reduces the hardware requirements which enables modulation to be accomplished without specially designed hardware (column 3 lines 28-33).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include above described method taught by Liu into Liu et al. and Umedas' operating method of the transmitter to reduce the total

computation cost and get other benefits such as high efficiency, simple implementation and no storage required (column 3 lines 34-59).

- With regard claim 11, which is a system claim related to claim 5, all limitation is contained in claim 5. The explanation of all the limitation is already addressed in the above paragraph.

9. Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 6,122,260) and Umeda et al. (US 5,568,472) and Liu (US 5,864,548) as applied to claim 5 above, and further in view of Huang (US 6,370,129).

- With regard claim 6, the limitation of wherein an antenna array has M-elements ($M > 1$), wherein individual ones of P orthogonal spreading codes are reused αM times within the coverage area, where $1/M < \alpha \leq 1$ can be taught by Huang and the explanation of the limitation is already addressed in the above paragraph 7.

All other limitation is contained in claim 5. The explanation of all the limitation is already addressed in the above paragraph 8.

- With regard claim 12, which is a system claim related to claim 6, all limitation is contained in claim 6. The explanation of all the limitation is already addressed in the above paragraph.

Conclusion

10. Reference US 5,499,236 is cited because they are put pertinent to the Space-Time spreading method of CDMA wireless communication with spatial filter. However, none of references teach detailed connection as recited in claim.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M Wang whose telephone number is (571) 272-3053. The examiner can normally be reached on 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Ted M Wang
Examiner
Art Unit 2634

Ted M. Wang



SHUWANG LIU
PRIMARY EXAMINER